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Are Active Labor Market Programs Effective in Developing Countries?

Active labor market programs in developing countries have had much smaller impacts than policy makers and participants have expected

Governments have long used active labor market programs to try to increase employment. Yet until recently there had been few rigorous tests of their effectiveness in developing countries. The past three years have seen the release of a number of studies using randomized experiments to test the impacts of these programs. These compare employment outcomes for a treatment group randomly assigned to participate in a program with the outcomes for a control group of similar individuals not participating. A critical examination of these studies in a recent paper by McKenzie reveals the limited impacts that many of these programs have had on employment creation.

Traditional active labor market programs are of three main kinds: programs aimed at increasing the employability of workers through vocational training; programs designed to increase the demand for labor by lowering its cost to firms through wage subsidies; and search and matching assistance programs aimed at reducing frictions that prevent demand from meeting supply in the labor market.

One reason people may struggle to find jobs is that they lack the technical skills demanded by employers. Vocational training programs aim to overcome this constraint by providing training in specific occupational skills, typically over a period of three

to six months. Some programs involve just classroom training, while others include internships to provide on-the-job training.

Only a third of studies testing such programs find a significant impact on employment. The simple unweighted average across the studies is equal to a 2.3 percentage point increase in employment. That is, for every 100 people offered vocational training, fewer than three will find a job that they would not otherwise have found. The result is a cost of around \$17,000–60,000 per additional person employed. The effects on earnings are also modest, with an average increase of only \$19 a month, and again the majority of studies fail to find a significant impact.

A second approach is to give job-seekers a wage subsidy voucher that they can take to employers when hunting for a job. This subsidy lowers the cost to the employer of hiring the worker for the period of the subsidy, often six months to a year. The hope is that this short-term employment experience may continue to have an impact once the subsidy has ended.

Experiments have tested the impact of wage subsidies for unemployed workers in Argentina and for unemployed youth in Jordan and South Africa. In both Argentina and South Africa employers were required to formally register the workers and comply with labor laws. This made employers very reluctant to use the vouchers. In contrast, the program in Jordan, which did not require firms to formally register the workers, resulted in a very

IN THIS ISSUE

Are Active Labor Market Programs Effective in Developing Countries? ... page 1

Are Automation and Trade Polarizing Developing Country Labor Markets, Too? ... page 2

How Does Innovation Affect Employment in Developing Countries? ... page 3

How Is the Internet Reshaping Work? ... page 4

Big Data from Online Job Portals ... page 4

The Motherhood Penalty and Female Employment in Urban India ... page 5

How Some Female Entrepreneurs in Africa Enter Male-Dominated Sectors ... page 6

Can Wage Subsidies Boost Employment in the Wake of an Economic Crisis? ... page 7

Understanding the Effects of the World's Largest Workfare Program ... page 8

How Do Cities in Ethiopia Create Jobs? ... page 9

What Is Behind the Decline in Wage Inequality in Latin America? ... page 10

Global Talent Flows ... page 11

Recent Policy Research Working Papers on Labor Market Issues ... page 12

(continued on page 12)

Are Automation and Trade Polarizing Developing Country Labor Markets, Too?

Labor markets show no evidence of polarization in developing countries on average, but there are emerging signs that this could change

The automation and outsourcing of routine, codifiable tasks are seen as driving polarization in labor markets in high-income countries. Recent studies in the United States and across the OECD document expanding job opportunities in both high-skill, high-wage occupations and low-skill, low-wage occupations, coupled with contracting opportunities in middle-wage, middle-skill white-collar and blue-collar jobs.

Should we expect to find this sharp polarization of labor markets emerging in the developing world as well? A recent paper by Maloney and Molina explores this question using global census data. It begins by arguing that there are several reasons to expect weaker forces of polarization in developing than in advanced economies:

- Developing countries begin with a smaller population in such codifiable tasks and thus with fewer jobs to displace.
- Jobs offshored from advanced economies are moving to developing countries, so we would expect to see a complementary expansion of the middle—a “depolarization” of the wage distribution in at least some host countries.
- New technologies may provide new leverage to break down barriers to entry and efficiency growth and facilitate information flows on markets and opportunities, making entirely new industries possible.
- Because information and communication technology (ICT) capital stocks are lower in developing countries, the displacement effects on jobs directly affected by ICT adoption may be lower.
- The employment impact of technological progress depends on the relative product elasticity: if the fall in price arising from the labor savings more than proportionately increases

demand, we will see an expansion of employment. Because more open developing countries are often assumed to be price takers, productivity gains should lead to greater employment.

- The degree to which automation is adopted depends heavily on a country’s capacity to absorb technology, the skill of its workforce, the ability to mobilize resources for large capital investments, the capacity for maintenance, and attention to tolerances that may make it less easy to substitute away from labor.

- To the degree that automation does occur, the likelihood of developing the kinds of upgraded jobs that are necessary complements to automation would appear to be lower in countries with a weak educational base.

The first set of estimates of the combination of these effects is modestly pessimistic. Using labor force surveys, the World Bank’s *World Development Report 2016: Digital Dividends* argues that middle-skill occupations intensive in routine cognitive and manual skills have decreased across the developing world, except in Argentina, China, Ethiopia, and Nicaragua.

In their paper Maloney and Molina track job categories across time for 21 developing countries in Africa, Asia, and Latin America following the approach of David Autor (“The Polarization of Job Opportunities in the U.S. Labor Market: Implications for Employment and Earnings,” Center for American Progress and the Hamilton Project, 2010). They use the Integrated Public Use Microdata Series (IPUMS) developed by the Minnesota Population Center, which harmonizes census micro-data from around the world and offers a standardized set of occupational categories.

They first replicate Autor’s results for France and the United States, where operators and assemblers as well as crafts show a decline over the past decade compared with elementary occupations and more skilled categories. Analysis aggregating across the advanced economies confirms this pattern.

But in developing countries on average, operators, professionals, and elementary occupations all increase at around the same rate. In Vietnam, perhaps the archetypal offshoring destination, operators and assemblers have increased relative to every category except professionals. The story is similar in India, up to 2004. Broadly similar patterns appear in Ecuador, the Arab Republic of Egypt, El Salvador, Ghana, Malawi, Mali, Morocco, Nicaragua, Peru, and South Africa.

Yet there are important exceptions suggesting that this may not always be the case. Indonesia shows an absolute fall in the operators category along with a rise in technicians and service and elementary occupations. Brazil and Mexico both show relatively slow growth of the operators category that, while not the absolute hollowing out found in the United States, is consistent with polarization. Press accounts suggest the emergence of the same automation dynamic in China, where robotization is proceeding rapidly.

This raises two concerns related to internal and international equity. In developing countries, as in advanced economies, the new, more complex labor tasks expected to complement automation may emerge very slowly. In China recent college graduates report problems finding jobs or consider themselves underemployed.

Globally, the concern is that as automation eliminates routine manufacturing-type jobs, we may see a short-circuiting of the traditional forces generating the “flying geese” pattern in which stages of the value chain are passed down from advancing to lagging economies. In this case there may remain a large global population who will not be writing code and programming robot routines anytime soon—but who will also not be inheriting unskilled jobs.

William F. Maloney and Carlos Molina. 2016. “Are Automation and Trade Polarizing Developing Country Labor Markets, Too?” Policy Research Working Paper 7922, World Bank, Washington, DC.

How Does Innovation Affect Employment in Developing Countries?

Innovation boosts employment by firms—though at a decreasing rate as they move toward the technological frontier

Innovation—the introduction of new or substantially improved products, processes or organizational structures—is key to driving the growth of firms. It increases their ability to compete in international markets by improving their product mix and helps enhance their productivity through the adoption of new technologies and production processes.

While the benefits of innovation for productivity and firm growth are well established, little is known about the short-term direct effect of innovation on employment, especially in countries furthest from the technological frontier. An emerging empirical literature is documenting the economy-wide effects of new technologies on job polarization, but there is little evidence of the employment impact that introducing new products and processes has on innovative firms. Introducing new product or service lines can generate direct positive impacts on employment. But introducing new processes with enhanced and more modern technologies can result in more efficient use of labor, leading to less additional employment or even the replacement of existing plant workers.

Thus a critical question for policy is whether innovation generates trade-offs between productivity increases and employment growth. Determining what the trade-offs might be (if any) is critical, especially in developing countries facing the greatest needs to absorb new entrants to the labor market in formal and higher-productivity jobs.

A recent paper by Cirera and Sabetti addresses this gap and sheds some light on the direct impact of technological and organizational innovation on firm-level employment growth in a sample of more than 15,000 firms in Africa, South Asia, the Middle East and North Africa, and Eastern Europe and Central Asia.

This unique data set, based on innovation surveys implemented by the World Bank's Enterprise Survey unit, is comparable across 53 countries. The analysis uses a methodology that exploits the relationship between the sales associated with the introduction of innovations and changes in employment. In addition to expanding the evidence to developing countries, the paper explores in detail the impact of process innovation and automation on employment as well as considering the impact in relation to the degree of novelty of the product innovation.

The results suggest that in lower- and middle-income countries, and especially in Africa, a dollar increase in sales from innovative products is associated with greater employment growth than in high-income countries. This is mainly because innovations in lower-income countries tend to be more incremental—primarily small upgrades to existing products and processes—and lead to smaller efficiency gains. The model estimates unity elasticities for most of these countries, suggesting that if all products could be replaced by new or upgraded ones, the firm's overall level of employment would be at least as high as the previous level and would not decrease. However, for high-income countries in the sample, especially in Eastern Europe and Central Asia, new sales attributable to innovation generate new employment but at lower rates, since the new or upgraded products are more efficient in the use of labor.

The evidence suggests that product innovation is the main channel of employment creation. Organizational innovation appears to have no impact on employment changes, whether it is implemented alone or with product innovation. Process innovation also appears to have no impact on employment, even when it takes the form of introducing automation. The main effects of these types of innovation are likely on the quality of labor—skill-biased technical change—rather than on its quantity. However, the authors find some support for the idea that

automation may actually displace labor by reducing the employment elasticity of product innovation when these are introduced jointly.

The results have important implications for policy. Innovation policy, when effective in leading to an increase in innovation activities and successful innovations, even through imitation, can also be an important policy for increasing employment in the short run. This is especially so for those countries furthest from the technological frontier, where generating new sales due to innovation has the largest effect on employment. But for higher-income countries, because of their greater ability to generate productivity gains in new products, these new sales have a smaller effect on employment. These results, qualitatively similar to previous findings in advanced economies, highlight a positive direct effect of innovation on the quantity of employment—though at a decreasing rate as firms transition to the technological frontier.

How Is the Internet Reshaping Work?

Evidence from Europe suggests that the internet has led to a rise in part-time work and telecommuting

The rise of alternative work arrangements—the “gig” economy—is a trending topic. It is often said that part-time and freelance positions are increasing while salaried full-time jobs are disappearing.

There is some empirical evidence for this. According to McKinsey, more than 24 million people are providing services through sharing economy platforms in the United States and Europe. Using a new survey, Lawrence Katz and Alan Krueger find that almost all the net job creation in the United States since 2005 has been in alternative work arrangements. And in a recent paper Vazquez and Winkler estimate that the share of workers in traditional work arrangements (permanent, full-time salaried jobs) has fallen dramatically in most European countries since the early 2000s.

Some scholars argue that the internet, by making it easier to break jobs

into smaller tasks, could explain these trends. Vazquez and Winkler investigate whether the internet has contributed to the rise of alternative work arrangements in Europe, hypothesizing that if the internet is truly changing the labor market, we should see larger and more rapid changes among sectors more dependent on digital technologies.

The authors find evidence supporting their hypothesis. European countries that were early adopters of telecommunications reforms aimed at increasing the availability and affordability of the internet experienced more dramatic labor market changes among internet-intensive sectors. The earlier the reforms were implemented, the faster the job creation in sectors that depend more on the internet to conduct their operations. And workers in internet-intensive sectors experienced more rapid growth in part-time employment and telecommuting.

These findings are consistent with the idea that internet adoption tends to increase alternative work arrangements in Europe. What are the policy

implications? New technologies represent both opportunities and challenges. More flexible work arrangements could help some sociodemographic groups facing barriers to participation in the labor market, such as persons with disabilities and older workers. But unless other barriers are also removed, technologies may not help them at all.

At the same time, technological change poses challenges to social protection systems, designed during a time when a lifetime salaried job was the standard. Alternative work arrangements may require a social protection system where contributions and benefits are linked more to the individual and not to the job.

Finally, online platforms are generating a process of creative destruction, where traditional jobs are being replaced by new and more productive ones. Policies to ease the transition of displaced workers toward new jobs will be crucial to smooth the disruptive effects of the internet on the labor market.

Emmanuel Vazquez and Hernan Winkler. 2017. “How Is the Internet Changing Labor Market Arrangements? Evidence from Telecommunications Reforms in Europe.” Policy Research Working Paper 7976, World Bank, Washington, DC.

Big Data from Online Job Portals

Online job portals generate big data useful in analyzing labor markets and the demand for job skills

Economists and other social scientists are increasingly using big data analytics to address long-standing economic questions and complement existing information sources. Big data produced by online platforms can yield a wealth of information. Online job portals, whether global (LinkedIn, Indeed, Monster, CareerBuilder) or local, potentially offer a rich and continuous stream of labor market data that remains largely untapped by policy makers.

In a new paper Nomura, Imaizumi, Areias, and Yamauchi examine how data from online job portals can be used for policy-relevant research in the

fields of labor economics and workforce skills development. Through an empirical analysis of information generated by Babajob, an online Indian job portal, the authors highlight key areas where such data could contribute to the development of labor market policies and analytical knowledge, including observing job-search behavior, improving skills matching, and projecting demand for workforce skills.

The authors’ analysis provides a unique case study on labor market data analytics in a developing-country context. It also reflects the diverse methodologies allowed by the Babajob data. While online job portals are by no means representative of the entire labor market, the granularity and uniqueness of the data they capture offer advantages over traditional survey instruments.

One illustration is wage analysis based on more than 50,000 job advertisements from daily postings in 20 cities between 2011 and 2015. The analysis reveals a cyclical but upward trend in wage offers. Except in 2012, wage offers show a fall around early summer months and a rapid increase toward the end of the year.

Another is text analysis based on the words most frequently used in describing required skills in job advertisements. Using word clouds to understand employers’ demands for skills, the authors show that skill- and qualification-related words appear more often in professional-level job descriptions. For both professional and nonprofessional jobs, *experience* and *communication* are the most

(continued on page 10)

The Motherhood Penalty and Female Employment in Urban India

Urban women are unlikely to enter the labor market in India unless the state, employers, and families weave a web of support

Indian women have been dropping out of the labor market since 2004, prompting a swath of empirical and theoretical work seeking to explain why. One important fact is that women's exit from the labor market has been driven largely by their withdrawal from agriculture, while urban areas have remained unaffected.

Cities and towns, having benefited from India's legendary economic growth since the 2000s, might be expected to serve as hubs for jobs for men and women alike. Moreover, women's educational attainment has risen over time and they are having fewer children, aspects that typically enhance women's labor force participation in other settings. Yet women's employment in urban areas has always been very low, never exceeding 25 percent. Some observers have argued that women are unable to get jobs commensurate with their qualifications and aspirations, others that cultural norms of status and seclusion inhibit women's entry into the labor market.

Despite the conundrum of low and static female labor force participation in urban areas amid rising prosperity, the empirical work has focused mostly on the country as a whole or on rural areas. A recent paper by Das and Žumbytė focuses on urban women in India, looking at how motherhood affects their chances of being employed. The authors are motivated by the fact that marriage on its own, and the presence of a young child in the family in particular, are known to depress women's labor force participation in India, as in several other countries. They draw on the demographic literature on "maternal role incompatibility," which posits that the roles of mother and worker may be inherently incompatible, and argue that there is a "motherhood penalty" for urban Indian women.

The authors anchor their analysis in the normative constructions of motherhood in India, where mothers have an exalted role and women who are perceived as not fulfilling that role in the traditional sense are censured both within and outside the home. Moreover, child care is almost entirely the responsibility of the mother. While Indian fathers are becoming increasingly involved in child rearing, they are perhaps more involved after the child starts school. There is little empirical evidence on the manner and extent to which women's caregiving roles impede their ability to undertake market work. It may of course be possible that women want to stay home with their children, but the reality is likely to be more complex than that.

Using pooled data from six rounds of the National Sample Survey, the authors examine the effects of having a young child on mothers' employment in urban India over the period 1983–2011. They focus on women in the age group 25–55, a range in which the younger women have completed higher education and the older ones are too young to retire. They also look at household structure by factoring in the effects of other household members on women's labor supply.

The authors find that while the responsibility of child bearing has lessened because of the secular decline in fertility, the onus of child rearing appears to have increased: having a young child in the household reduces urban mothers' likelihood of being employed, and this effect has intensified over time. The presence of mother surrogates, in the form of other women in the home, somewhat attenuates this negative effect. But overall, the motherhood penalty is an important factor in women's decisions to enter or stay in the labor market.

What does this mean for policy aiming to attract more women into the labor market? Providing affordable, high-quality child care and ensuring that women have access to safe transportation are of course quick wins. It is also fashionable to say that

norms need to change, but in fact change in norms often follows strong policy interventions—and as family policy across the world has shown, norms and behaviors respond well to incentives.

The state could also signal a more enabling vision for women and mothers in different ways. Publicly funded information campaigns that value women as workers and project an image of child care as a shared responsibility in the home are likely to remove some of the guilt that women often experience when they leave children behind to go out to work. Such campaigns have been effectively used in India and elsewhere to encourage literacy, to achieve health outcomes such as immunization or family planning, or to enroll participants in social programs such as conditional cash transfer schemes.

Both the state and the private sector in India are beginning to gingerly experiment with options for attracting more women into the labor market. A better understanding is needed of what these initiatives are, how well they work, and how they can be scaled up. Because unless the state, employers, and families weave a web of support, women are unlikely to enter the labor market.

How Some Female Entrepreneurs in Africa Enter Male-Dominated Sectors

Female entrepreneurs in Africa can earn more in male-dominated sectors. What explains why some cross over while others do not?

In Africa businesses owned by women have a lower performance on average than those owned by men—on size, profitability, survival rate, and growth trajectory. These gender differences can be explained by the different strategic choices made by male and female entrepreneurs. Among these strategic choices is the sector in which they operate, a consistent and important determinant of gender differences observed in firms' performance and growth. Among African entrepreneurs, women are concentrated in catering, retail trade, garments, hairdressing, and other services, while men engage in a wider range of sectors, including construction and manufacturing. Do these differences arise because most women prefer to work in certain sectors, or because they are constrained in their choice of profession?

A recent paper by Campos, Goldstein, McGorman, Boudet, and Pimhidzai looks at this question in Uganda, where only 6 percent of female entrepreneurs operate in male-dominated sectors (defined as sectors where more than 75 percent of enterprises are male-owned), while 34 percent of male entrepreneurs have businesses in these sectors. The study investigates differences in sectoral choice between men and women and examines the role of factors that may help female entrepreneurs cross over into male-dominated sectors or hinder them from doing so.

The study uses a mixed-methods approach to investigate the differences in enterprise size and performance between women who cross over to male-dominated sectors and those who do not. It draws on two data sets: a baseline survey, conducted for an impact evaluation, of male and female entrepreneurs in urban Uganda who are part of the Katwe Small-Scale

Industry Association; and a qualitative and quantitative survey of women operating in male-dominated sectors as well as women operating in traditional sectors.

The analysis examines potential differences in household demographics, wealth status, financial access, entrepreneurial characteristics, exposure, and business challenges to understand the factors associated with women crossing over. These differences are interpreted as correlations between the outcome of interest and a woman's likelihood of crossing over, though the direction of causality cannot be confirmed.

The analysis reveals two significant findings. First, firms owned by women who cross over are about three times as profitable on average as those owned by other women. Second, businesses owned by women in male-dominated sectors are just as profitable as those owned by men in those sectors. So there is a clear rationale for crossing over. But what allows certain women to cross over, and what prevents more women from doing so?

While the women who cross over may differ in some dimensions of their personality, they are not more likely to consistently score higher on the skills that would aid them in becoming successful entrepreneurs. Analysis of scores on two cognitive tests measuring working memory and fluid intelligence—indicators of an entrepreneur's ability to understand and solve complex problems—shows that these are not important in explaining women's entry into male-dominated sectors. The authors also considered a variety of noncognitive tests to gauge innate entrepreneurial spirit, which may be useful in predicting an entrepreneur's success over time. Women who cross over did not score consistently better on these tests either. Nor did they have more years of education or greater access to finance.

Two things that do seem to matter are access to information and psychosocial factors. Women who remain in female-dominated sectors simply do

not know that they are making less money than those who cross over. Indeed, among those making less than the crossovers, about 75 percent believe that they make as much as female entrepreneurs in male-dominated sectors.

In addition, the influence of male role models and exposure to a sector through family and friends appear to be critical in helping women circumvent or overcome the norms that undergird occupational segregation. Women who reported having a male role model in their youth are 20–28 percent more likely to be a crossover. And women who do not cross over are more likely to have been introduced to traditionally female sectors by mothers and teachers. Moreover, once women engage in a traditionally female sector, they are unlikely to make the switch to a male-dominated one. Thus early influence by a male role model is important in shaping women's professional path to a more profitable sector.

This analysis suggests that operating in a male-dominated sector can lead to higher profits, indicating that encouraging female entrepreneurs to enter such sectors could be an important way to help improve women's economic status. It also provides avenues for piloting and testing programs to address occupational gender segregation through a combination of information, mentoring, and exposure to the sectors.

Francisco Campos, Markus Goldstein, Laura McGorman, Ana Maria Boudet, and Obert Pimhidzai. 2015. "Breaking the Metal Ceiling: Female Entrepreneurs Who Succeed in Male-Dominated Sectors." Policy Research Working Paper 7503, World Bank, Washington, DC.

Can Wage Subsidies Boost Employment in the Wake of an Economic Crisis?

Evidence from Mexico suggests that wage subsidies provided during the recent economic crisis helped employment recover faster

Unemployment often rises during an economic crisis, and policy makers take a range of actions to try to mitigate this increase. During the 2008/09 crisis, for example, 22 countries used some form of wage subsidy program to promote employment retention. Many studies have looked at the effect of wage subsidies on employment in noncrisis times, with mixed findings. But there is not much evidence on whether wage subsidies can raise employment in the wake of a crisis.

Conceptually, wage subsidies during a crisis make sense. Layoffs could slow the recovery, as rehiring and training workers may be costly for firms. Facing lower demand for their products, however, firms may not have the financial means to keep paying their workers, particularly in the presence of credit constraints, which are often exacerbated during a crisis. This is where wage subsidies come in. But do these subsidies really cause firms to retain workers they otherwise would not have retained? Ultimately, we just don't know.

To get a better understanding of these issues, Bruhn recently studied a wage subsidy program in Mexico. Under this program firms in certain durable goods manufacturing industries were eligible to receive wage subsidies during the period from January 2009 to August 2009. To receive a subsidy firms were not allowed to fire more than a third of their workforce as a percentage of the drop in sales they had experienced during the economic crisis; for example, if sales dropped by 30 percent, they could not fire more than 10 percent of their workforce.

The total funding disbursed through the program was about \$63 million, with a median of \$92,000 per firm. In practice, firms typically received the subsidy many months after they limited layoffs, in part because reviewing applications took some time. Most funds were approved starting in June 2009.

Bruhn obtained monthly administrative data on employment at the industry level from the Mexican Social Security Institute, covering nine years before and four years after the program's implementation. She used propensity score matching to construct groups of eligible and ineligible durable goods manufacturing industries that show statistically identical pre-program trends in employment, then

compared how employment evolved in these industries during and after the program.

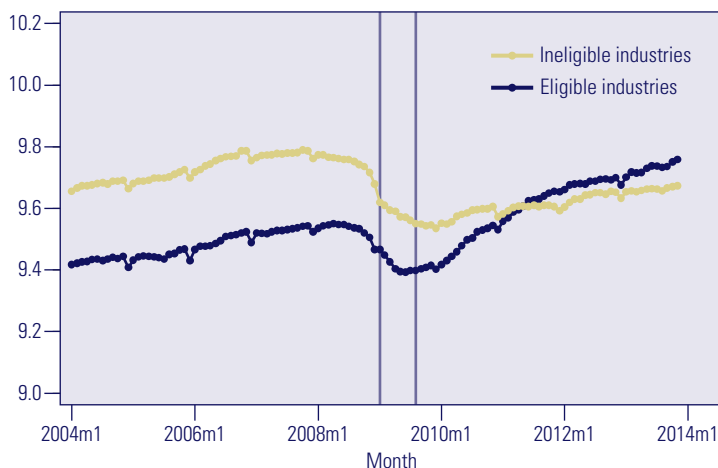
The results show a positive but not statistically significant effect of the wage subsidies on employment during the program, ranging from 5.7 percent to 13.2 percent, depending on the econometric specification. The size of the effect increased to a statistically significant 24 percent after the program ended, and the results indicate that employment recovered faster in eligible industries than in ineligible ones. Indeed, in eligible industries employment was back at precrisis levels in 2011, while in ineligible industries it was still not back at precrisis levels in 2013 (figure 1).

The impact on firms' employment levels is larger than other estimates in the literature. This suggests that wage subsidies may be particularly effective during an economic crisis, since they can be paid for a short time and have lasting effects on employment.

At the same time, the lack of a statistically significant effect on employment during the program suggests that the firing restrictions imposed by the program were not binding. That is, even in the absence of the program, firms that received the subsidy would not have fired more than a third of their workforce as a percentage of their drop in sales during the crisis.

Instead, the program's effect seems to have operated through the payment of subsidy funds. These funds may have provided liquidity for rehiring workers, allowing firms to take advantage of market opportunities at a time when other funding sources were scarce. Indeed, the time when employment started to increase again in eligible industries (mid-2009, as shown in figure 1) coincided with the time when the subsidy funds started to be paid out.

Figure 1. Average Employment in Matched Industries in Mexico, 2004–14
Average log employment



Note: The figure shows data from the Mexican Social Security Institute. The two vertical lines denote the start and end of the wage subsidy program (January and August 2009).

Miriam Bruhn. 2016. "Can Wage Subsidies Boost Employment in the Wake of an Economic Crisis? Evidence from Mexico." Policy Research Working Paper 7607, World Bank, Washington, DC.

Understanding the Effects of the World's Largest Workfare Program

India's rural workfare program has boosted agricultural productivity as well as increasing wages and employment levels

As the world's largest workfare program, India's Mahatma Gandhi National Rural Employment Guarantee Scheme (NREGS) has attracted much attention. Yet its impacts on agriculture have been relatively neglected. A recent paper by Deininger, Nagarajan, and Singh addresses this gap by focusing on the program's effects on agricultural productivity as well as labor market outcomes.

The program offers unskilled employment, for up to 100 days a year per household, in projects to provide local productivity-enhancing infrastructure. Wages are set by statute, at rates that are equal for men and women and, it is hoped, not attractive enough to prevent effective self-targeting.

Workfare programs like NREGS can affect agricultural productivity through several channels. By using labor, they can affect wage rates and employment levels in the short term and producers' choice of technology and the capital intensity of production in the medium to long term. By providing implicit insurance against downside risk, in the form of predictable wage payments, they may allow poor farmers to increase investment or adopt crop portfolios with higher risk-return profiles. And by constructing or improving local infrastructure, they may increase agricultural productivity and thus boost returns to land and labor, the main assets of small farmers and the rural poor.

The authors use unique panel data covering the same households in 1999/2000 (before the program) and 2007/08 (after some had received the program), complemented by information on the program's implementation in a subset of villages. Using these data and a robust method, they assess the program's short-term impacts on rural wages, labor demand,

and agricultural production structures. They find that in the short term NREGS led to a marked increase in agricultural wages and higher levels of nonfarm casual work and on-farm self-employment. The program triggered more intensive use of irrigation and greater diversification of crop portfolios, especially by small farmers. It also increased productivity, largely by alleviating liquidity constraints and improving access to insurance.

Results suggest that the program increased the wage significantly without crowding out private employment. Most of this increase can be attributed to higher wages in agriculture, which affected men and women about equally. Women also experienced an increase in nonagricultural wages.

Analysis of the extent to which wage changes affected labor allocation points to insignificant impacts on agricultural wage work in the aggregate. While a significant increase in nonfarm casual work may be attributed to the aggregation of NREGS and other work, there is also evidence of a program-induced increase in on-farm self-employment. But while men increased their labor supply to the agricultural sector, women shifted away from farm to nonfarm employment and to some extent salaried work.

Increases in labor supply to the nonfarm sector were concentrated among landless and small to medium-size farmers, suggesting effective self-targeting. Increases in labor supply to agricultural self-employment emerged only for small and, to some degree, medium-size farmers, possibly because some NREGS investment can be performed on farms. There is also some evidence of a reduction in nonfarm self-employment and an increase in salaried work by the largest landowners.

Results indicate that the program had a significant impact on agricultural productivity, in part by supporting diversification. Evidence suggests that the program led to greater use of machinery and fertilizers, a shift beyond rice and wheat toward riskier crops not

covered by government-imposed floor prices, and an increase in the intensity of cultivation (the number of seasons in which crops are grown during a year). Some of these effects may be explained by the program's effects in increasing farmers' liquidity. In addition, the rehabilitation of infrastructure and construction of new small-scale water conservation structures may have helped support more intensive land use, particularly the planting of a second or third crop beyond wheat or paddy.

Evidence on how workfare affects agricultural productivity matters not only for a better understanding of the NREGS intervention. It also has implications for the broader debate on the comparative merits of this type of approach. Workfare programs rely on work requirements as a screening device based on the assumption that such screening makes these programs a more cost-effective tool for social protection than, say, unconditional cash transfers. But such programs would be less desirable if they displaced existing workers rather than generating new jobs, if supply-side constraints were to reduce the effectiveness of self-targeting, or if the work done had no productive value. Concerns have been raised about NREGS in each of these areas. While further study of the extent to which such effects persist in the longer term is needed, the authors' findings suggest that the potential productivity benefits of workfare could be an important aspect to take into account in evaluating the impact or desirability of such programs.

Klaus Deininger, Hari K. Nagarajan, and Sudhir K. Singh. 2016. "Short-Term Effects of India's Employment Guarantee Program on Labor Markets and Agricultural Productivity." Policy Research Working Paper 7665, World Bank, Washington, DC.

How Do Cities in Ethiopia Create Jobs?

A new study looks at how Ethiopian cities can create the right conditions for entrepreneurs, firms, and industries to become competitive

In Ethiopia, which aims to become a middle-income country by 2040, industrialization appears to be the main instrument at the government's disposal for creating employment and growth. In a recent paper Mukim focuses on understanding whether and to what extent firms in light manufacturing industries in Ethiopia are driving sustained job creation, and to what extent their immediate spatial environment—that is, cities—determines their success over extended periods. The World Bank Group's 2015 flagship report *Competitive Cities for Jobs and Growth* found that if cities support their firms and industries in creating jobs, millions of additional jobs could be created every year. Are Ethiopian cities creating the jobs the country needs—and if so, how?

Descriptive statistics reveal that the capital, Addis Ababa, accounts for the dominant share of firms and employment across the country. But firms in new, emerging cities (such as Adwa, Debreziet, and Sebeta) are the most employment-intensive. And while fast-growing industrial towns (such as Hawassa, Mekele, and Nazareth) attract many new firms, these new entrants create fewer jobs than their counterparts in other Ethiopian cities, suggesting greater capital intensity in production.

What is worrying, though unsurprising, is that large firms account for most of the existing employment in Ethiopia. Large firms also create 97 percent of new jobs. And indeed it is incumbents, not entrepreneurs, that account for much of the sustained job creation—new entrants create but also destroy many jobs. There is also huge variation in net job creation across cities.

If large, existing firms are creating most of the sustainable jobs, how easily can firms graduate in size from

small to medium to large? The statistics suggest that rates of graduation are extremely low: of all small enterprises (21–50 employees), only 6.5 percent graduate over time to large-enterprise status (101–1,000 employees).

Why are some firms, industries, and cities able to grow employment, while others seem to lag behind? Using an econometric model, the author models job growth at the firm level as a function of economic geography (agglomeration), business environment, and infrastructure. These variables include factors that are common to the city as well as factors that are common to particular industries within the city. Agglomeration includes localization and industrial diversity, business environment includes licensing fees and taxes, and infrastructure includes the costs of transport and electricity.

What factors appear to drive sustained increases in jobs across Ethiopian cities? The answer varies somewhat depending on the outcome of interest. For job creation over time, important factors are intra-industry clustering, low taxes and low licensing fees, and access to better electricity and transport services. For the emergence of “job superstars,” enterprises that double their employment every four years or so, industry concentration and low licensing fees are again important factors. This is particularly true for small and medium-size enterprises, for which providing a boost to growth would help in graduating into large enterprises. Finally, if the outcome of interest is to increase employment at the city level, intra-industry clustering and industrial diversity matter. Keeping transport costs low also helps.

How can public policy draw on these findings to improve economic outcomes for Ethiopian cities?

- Identify and invest in cities' competitive advantage. Secondary and smaller cities are seeing the growth of naturally forming industrial clusters, while Addis Ababa's advantage seems to lie in its diverse industrial structure. Investments in growth corridors (for example, Bahir Dar–Gondar,

Mekele–Dessie, Harar–Dire Dawa, and Addis Ababa–Hawassa) would help strengthen linkages within and between cities.

- Identify and invest in growing the missing middle of companies and jobs. To increase opportunities for wage employment, cities must identify and invest in the factors that allow existing firms to expand and to create new jobs and that encourage firms to graduate, such as better-regulated taxes and access to infrastructure.

- Target interventions according to the constraints and needs of different types of firms. Access to facilities and services would help small businesses create linkages and grow. Improvements in local business licensing and permitting systems would help medium-size enterprises grow. And better access to land and connective infrastructure would help large enterprises flourish.

Ethiopia has a small yet significant window of opportunity to exploit its demographic dividend. Its labor force has doubled in size over the past two decades, and a very large youth bulge will continue to enter the labor market over the next 20 years. Many of these young people will be moving to cities in search of employment. Urbanization could become one of the most important catalysts of economic growth and job creation over the next few years, even decades. Cities should aim to create the conditions for entrepreneurs, firms, and industries to become competitive.

What Is Behind the Decline in Wage Inequality in Latin America?

Latin America's most experienced workers have seen their experience premium over younger workers fall by almost half since 2002

Latin America has been characterized as having an excess of inequality for being a middle-income region. Indeed, the region ranks as the second most unequal in the world, right behind Sub-Saharan Africa. But while income inequality in Latin America remains substantial, the region is also known to have experienced a turning point in the early 2000s, shifting from a trend of slightly increasing inequality during the 1990s to one of steady decline. This represents a sharp contrast with what has occurred in other developing regions, particularly in Europe and Central Asia and in East Asia and the Pacific, where income inequality has been on the rise since the early 2000s.

A vast literature exists on the rise and fall of total income inequality across Latin America. In sharp contrast is the scarce evidence about the facts behind changes in labor income inequality across the region. A recent paper by Rodríguez-Castelán, López-Calva, Lustig, and Valderrama aims to fill this gap in knowledge. The study takes advantage of harmonized data for 17 countries in Latin America (which cover around 90 percent of the region's population) starting in the early 1990s. Through analysis of these data, it provides an overview of the main factors that could be at play in the trend reversal in labor income inequality observed across the region since the early 2000s, as the unweighted average Gini coefficient of wage inequality fell from 0.473 in 2002 to 0.410 in 2013.

The analysis shows that the decline in labor income inequality was supported by a substantial expansion in real hourly earnings at the bottom of the distribution. In particular, since 2002 the labor incomes associated with relatively low-paying jobs (those in the bottom decile of the earnings

distribution) have risen by more than 50 percent in real terms. This is significantly more than the 15 percent growth among higher-paid workers (those in the top decile of the earnings distribution) and also more than the 32 percent growth experienced in the median of the distribution. In contrast, the increase in labor income inequality during the 1990s was supported by a reduction in real earnings at the bottom of the distribution, while the rest of the distribution showed no change in real earnings or slightly positive growth.

Results also highlight a steady decline in the education premium in Latin America since the early 2000s that has been driven by greater growth in labor earnings among less well-educated workers than among workers with a high school or college education. This drop in the education premium has been coupled with a steady fall in the experience premium. This decline, which has been accelerating since the early 2000s, is a novel fact for the region and has also been the aspect of the paper receiving the most attention. The most experienced workers have seen their experience premium with respect to younger workers fall by almost half. Indeed, after 2002 most countries in the region experienced rapid reductions in these premiums.

The study also provides evidence that the gender wage gap has narrowed consistently since the mid-1990s but was almost stagnant during the first decade of the 2000s. This suggests a weak relationship between the gender earnings gap and the trend reversal in wage inequality. Correspondingly, the urban-rural earnings gap widened in the 1990s but then narrowed sharply during the 2000s, an outcome closely related to what happened in overall labor income inequality.

In addition, the study finds that the narrowing in the earnings dispersion among workers with different observable attributes (education, experience, gender, and location), though important, still accounts for less than half the reduction in earnings inequality. In

contrast, more than half the reduction in labor income inequality observed in the region since the early 2000s stemmed from a reduction in the variance of the earnings of workers with similar characteristics—what is known in the literature as residual earnings inequality. This fact calls for further investigation, particularly to clarify the extent to which this outcome has been due to changes in the composition of the labor force across the region.

Carlos Rodríguez-Castelán, Luis F. López-Calva, Nora Lustig, and Daniel Valderrama. 2016. "Understanding the Dynamics of Labor Income Inequality in Latin America." *Policy Research Working Paper 7795*, World Bank, Washington, DC.

(continued from page 4)

Big Data from Online Job Portals

frequently used words. Keywords related to language skills and customer care appear more often in advertisements for nonprofessional jobs; those related to problem-solving, leadership, analytical skills, work ethic, reliability, creativity, and personality attributes tend to appear more often in professional job descriptions.

Big data from online job portals are not only very frequent and dense; they also present a greater variety of information and a more intense degree of granularity than existing information sources. This case study shows how big data analytics has opened new avenues for objectively monitoring workforce skills demand with a wide array of applications.

Shinsaku Nomura, Saori Imaizumi, Ana Carolina Areias, and Futoshi Yamauchi. 2017. "Toward Labor Market Policy 2.0: The Potential for Using Online Job-Portal Big Data to Inform Labor Market Policies in India." *Policy Research Working Paper 7966*, World Bank, Washington, DC.

Global Talent Flows

Agglomeration factors drive the patterns in high-skilled migration—and reinforce the inequality in the global competition for skills

Highly skilled workers play a starring role in today's knowledge economy. They make exceptional direct contributions, including breakthrough innovations. As teachers, policy makers, and entrepreneurs they guide the actions of others. They propel the knowledge frontier and spur economic growth. In this process the mobility of skilled workers, within and across national borders, becomes critical to enhancing productivity. Using newly available data, a recent paper by Kerr, Kerr, Özden, and Parsons reviews the landscape of global talent mobility and discusses the causes and consequences of high-skilled migration.

Much attention has been paid to understanding the worldwide distribution of human capital and how global migration flows further tilt the deck against poor countries. The migration patterns we see today are the result of a complex tangle of firms and other employers pursuing scarce talent, governments trying to manage these flows through policy, and individuals seeking their best options given the constraints imposed on them. The central outcome, however, is clear: the flows of high-skilled migrants are very concentrated, both within and across national borders.

Overall rates of international migration have been hovering around 3 percent over the past 60 years. But beneath this perceived stability are certain strong asymmetric patterns, especially with respect to human capital. There were about 28 million high-skilled migrants (those with at least one year of tertiary education) in OECD countries in 2010, reflecting an increase of nearly 130 percent since 1990. This exceptional rise is the result of several forces, including increasing efforts by policy makers to attract human capital as they recognize its

importance in economic growth, pull factors generated by skill agglomeration, lower transportation and communication costs, and the rising number of international students.

While OECD countries account for less than a fifth of the world's population, they host two-thirds of high-skilled migrants. Among OECD destinations the distribution is even more skewed. Four English-speaking countries—the United States, the United Kingdom, Canada, and Australia—are the chosen destinations for nearly 70 percent of high-skilled migrants to the OECD. The United States alone hosts close to half of all high-skilled migrants to the OECD. The attractiveness of these destination countries has led others, such as France, Germany, and Spain, to increase their policy efforts. Nevertheless, the volume of skilled migration to these four countries, coupled with the asymmetry in the concentration of leading universities, high-tech firms, and research centers, implies that the global competition for skills will continue to be unequal.

Agglomeration of talent is even starker at the highest levels. The Nobel Prizes in Chemistry, Medicine, Physics, and Economics provide powerful examples. Since World War II more than 65 percent of these Nobel Prizes have been awarded to academics associated with U.S. institutions, only half of whom were born in the United States. Of all these Nobel Prizes, around a third have gone to immigrants, more than half of whom were affiliated with U.S. institutions.

Many host countries end up with higher concentrations of high-skilled immigrants in particular occupations. For example, immigrants account for some 57 percent of scientists in Switzerland, 45 percent in Australia, and 38 percent in the United States. Foreign-born individuals made up 27 percent of all physicians and surgeons and more than 35 percent of current medical residents in the United States in 2010.

Stark inequalities in the concentrations of talent also exist across cities

and regions within destination countries. The United States has significant concentrations of high-skilled migrants in Boston, New York City, and Seattle as well as California. These spatial concentrations are even sharper in scientific fields and are also present globally.

What about origin countries? Many have limited educational capacities and fiscal resources to train workers or to replace those who have emigrated. Countries with particularly high emigration rates of high-skilled workers to OECD destinations in 2010 tended to be small, low-income countries and island states, such as Guyana (93 percent) and Haiti (82 percent). There is a strong inverse relationship between country size and high-skilled emigration rates. These movements of high-skilled people away from certain small and low-income countries have raised controversies about “brain drain.”

Agglomeration economies explain the high-skilled migration patterns. The presence of high-skilled people in a location—whether natives or immigrants—increases the incentives for additional high-skilled people to move there because of a wide range of positive externalities. At the core of this process is trade in knowledge services provided by high-skilled people. Skill clusters allow better technology exchanges, deeper labor market specialization, and stronger complementary inputs.

These agglomeration factors and their implications for economic growth make the economics of high-skilled migration quite different from those of low-skilled migration. Moreover, the critical role of actors like firms and universities remains substantially unexplored relative to their importance. The data necessary to analyze these important patterns are just coming online, and the future research potential is immense.

large (38 percentage point) increase in employment while the subsidy was in effect. But when the subsidy ended, most of these youth left the firms and there was no lasting impact on employment.

A third set of studies considers programs designed to reduce information and search frictions and to better match workers and firms. These include job fairs, transport subsidies, public information services, and certification of hard and soft skills. These services tend to be much less expensive than training or wage subsidies, costing \$25 or less per person assisted.

These lower costs certainly lower the bar on the treatment impacts needed in order for the programs to pass cost-benefit tests. But of 10 different interventions, only one (in India) was found to have a significant impact on employment, increasing it by 2.4 percentage points over three years. The average impact across studies is 2.7 percentage points. Moreover, none of the studies finds a significant impact on labor earnings.

The conclusion is that most traditional active labor market programs have had at best only modest impacts on employment: for every 100 people that such programs aim to help, the typical impact is that two to three might gain employment, and this effect is seldom statistically significant. These impacts are much smaller than policy makers and program participants have expected in many cases.

Justifying these programs on a cost-benefit basis typically requires assuming that impacts persist for much longer than typically measured and that formal employment is to be especially valued.

Yet governments continue to face pressure to be seen to be doing something to help people find jobs. Thus unless better alternatives can be found, the lack of empirical evidence for the effectiveness of many traditional programs is unlikely to be enough to cause them to be abandoned. The paper discusses several potential approaches, including working more on policies to foster labor demand, and helping workers access different labor markets by removing barriers to their moving across job sectors and to different locations. Such efforts also need rigorous evaluation to determine their effectiveness.

David McKenzie. 2017. "How Effective Are Active Labor Market Policies in Developing Countries? A Critical Review of Recent Evidence." *Policy Research Working Paper 8011*, World Bank, Washington, DC.

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